

using said ΔG_u [is used] to express a change $\Delta G_{u'}$ between an intermediate value $G_{i'}$ according to another sign word i' in said Gray code and an intermediate value $G_{u'}$ according to an adjacent sign word u' different from said sign word i' only in a predetermined bit position v_i and

using said intermediate value $G_{i'}$ and said change $\Delta G_{u'}$ to obtain said optimal sound source vector.

REMARKS

By the present Amendment, claim 2 has been amended, and claim 1 has been canceled, without prejudice or disclaimer. Claims 2-6 are now pending in this application, with claim 2 being the sole independent claim presently under consideration. It is submitted that no new matter has been added by the present Amendment.

The Examiner requested that Figs. 1-4 be designated by a legend such as --Prior Art--. Submitted herewith is a Letter With Proposed Drawing Changes, wherein Figs. 1-4 are designated with the legend --Prior Art-- as requested. Withdrawal of the objection is respectfully requested.

The Examiner also objected to the drawings under 37 C.F.R.

1.83(a) for allegedly not showing every feature of the invention specified in the claims.

The patent statute as well as the rules state that a drawing is required if it is necessary to explain the claimed invention. In the present situation, the claims relate to a method and it is not too hard to see that with an adequate specification no drawings would be required at all. The objected to phrase is in claim 6, and the present specification commencing at page 21 provides a more than adequate description of the approach used in minimizing the Euclidian distance between a synthetic vector and the input vector. Moreover, it is difficult to visualize a drawing showing the objected to phrase. The equation approach is better.

Reconsideration is respectfully requested of the rejection of claims 1-6 under 35 U.S.C. 101, as allegedly claiming non-statutory subject matter. Claim 2 has been amended with particular attention to the points raised in the Office Action. For example, claim 2 now recites the step of using the intermediate value G_i and the change $\Delta G_u'$ to obtain the optimal sound source vector. It is respectfully submitted that claims 2-6 now claim statutory subject matter under 35 U.S.C. 101.

Reconsideration is respectfully requested of the rejection

of claims 2-6 under U.S.C. 102(b) as being anticipated by U.S. Patent 4,817,157 to Gerson.

Applicants have carefully considered the Examiner's comments and the cited reference, and respectfully submit that amended independent claim 2 is patentable over Gerson for at least the following reasons.

Applicants' invention as recited in claim 2 relates to a vector search method for obtaining an optimal sound source vector in vector quantization. In the claimed method, a difference error between a prediction vector and an input vector is calculated in such a way that combinations of factors respectively multiplied by a plurality of basic vectors are changed according to the Gray code. The method comprises the steps of: (a) obtaining an intermediate value G_u by calculation of a synthetic vector created according to a sign word u of the Gray code; (b) expressing G_u by an intermediate value G_i , obtained by calculation of a synthetic vector created according to an adjacent sign word i different from the sign word u only in a predetermined bit position v , and a change ΔG_u calculated by utilizing the Gray code characteristic; (c) using ΔG_u to express a change $\Delta G_{u'}$ between an intermediate value $G_{i'}$ according to another sign word i' in the Gray code and an intermediate

value G_u' according to an adjacent sign word u' different from the sign word i' only in a predetermined bit position v ; and (d) using the intermediate value G_i and the change $\Delta G_{u'}$ to obtain the optimal sound source vector.

Gerson, as understood by Applicants, relates to an excitation vector generation and search technique for a code-excited linear prediction (CELP) speech encoder using a codebook of excitation code vectors.

It is respectfully submitted Applicants' claimed invention is different from the excitation vector generation and search technique disclosed in Gerson, for at least the following reasons. The Examiner is correct that Gerson teaches the claimed steps of (a) obtaining an intermediate value G_u by calculation of a synthetic vector created according to a sign word u of the Gray code, and (b) expressing G_u by an intermediate value G_i , obtained by calculation of a synthetic vector created according to an adjacent sign word i different from the sign word u only in a predetermined bit position v , and a change ΔG_u calculated by utilizing the Gray code characteristic. These steps (a) and (b) correspond to Equation (10), which can be found in the present specification on page 14.

It is respectfully submitted, however, that the Examiner is

not correct in stating that Gerson teaches the claimed step of (c) using ΔG_u to express a change $\Delta G_{u'}$ between an intermediate value $G_{i'}$ according to another sign word i' in the Gray code and an intermediate value $G_{u'}$ according to an adjacent sign word u' different from the sign word i' only in a predetermined bit position v .

This step (c), taught by the claimed invention, is important because it operates to reduce the number of calculations of Equation (10), and therefore, the speed of the vector search method is increased. This step (c) is taught in the present specification as Equation (12) on page 15. Nowhere in Gerson is this step (c) shown or suggested.

Accordingly, it is respectfully submitted that amended independent claim 2, and the claims depending therefrom, are patentable over Gerson.

Applicants acknowledge the allowable subject matter of claim 6 indicated by the Examiner.

Favorable reconsideration is earnestly requested.

Respectfully submitted,
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